COLLISION REPAIR: NON-STRUCTURAL

COURSE DESCRIPTION

Collision Repair: Non-Structural is a course that prepares students to analyze non-structural collision damage to a vehicle, determine the extent of the damage and the direction of impact, initiate an appropriate repair plan, and correctly use equipment to fit metal to a specified dimension within tolerances. Course content includes metal finishing, body filling and glass panel replacements. The course prepares students for entry level employment and advanced training in collision repair technology, and post secondary education. Students completing the *Collision Repair: Non-Structural* are eligible to take the ASE written examination for Non-Structural Analysis and Damage Repair.

Prerequisite(s): Transportation Core

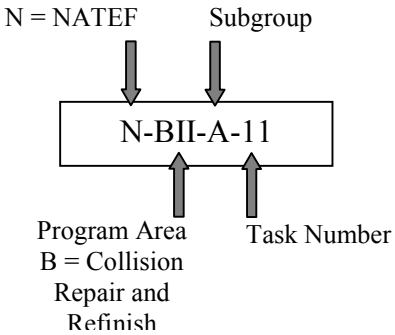
Algebra I or Math for Technology II; Physical Science or Principles of Technology I, Principles of Welding (100 hours) (may be concurrent)

Requirement: A minimum of 240 hours must be dedicated to non-structural analysis and damage repair and 100 hours in MIG welding to meet minimum standards set by NATEF.

Recommended Credits: 2

Recommended Grade Level(s): 10th, 11th or 12th

Notes: Course is aligned with NATEF tasks list for Collision Repair and Refinish - Non Structural Analysis and Damage Repair. Items have been organized based on the requirements of the Tennessee required course description format. NATEF tasks are referenced with the corresponding Performance Standards. Codes are as follows:



COLLISION REPAIR: NON-STRUCTURAL STANDARDS

1.0 Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

2.0 Students will apply mathematics and science concepts to collision repair and refinish technology.

3.0 Students will demonstrate proper procedures for preparing vehicles for repair.

4.0 Students will demonstrate proper procedures for making outer body panel repairs, replacements, and adjustments.

5.0 Students will demonstrate proper procedures for metal finishing, body filling, and moveable glass and hardware repair or replacement.

6.0 Students will properly perform welding and cutting techniques for collision repair.

7.0 Students will demonstrate communication skills required in the collision repair and refinish industry.

8.0 Students will demonstrate interpersonal and employability skills required in the collision repair and refinish industry.

9.0 Students will demonstrate safety practices pertaining to collision repair technology, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) requirements for a collision repair and refinish facility.

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 1.0

Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

LEARNING EXPECTATIONS

The student will:
1.1 Exhibit positive leadership skills.
1.2 Participate in SkillsUSA-VICA as an integral part of classroom instruction.
1.3 Assess situations and apply problem-solving and decision-making skills to situations in the community and workplace.
1.4 Demonstrate the ability to work cooperatively with others in a professional setting.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
1.1 Demonstrates character, leadership, and integrity.
1.2.A Applies the points of the creed to personal and professional situations.
1.2.B Participates and conducts meetings and other business according to accepted rules of parliamentary procedure.
1.3.A Analyzes situations in the workplace and uses problem-solving techniques to solve the problem.
1.4.A Participates in a community service project.
1.4.B Participates in a leadership activity.

SAMPLE PERFORMANCE TASKS

- Create a leadership inventory and use it to conduct a personal assessment.
- Participate in various SkillsUSA-VICA programs and/or competitive events.
- Evaluate an activity within the school, community, and/or workplace and project effects of the project.
- Implement an annual program of work.
- Prepare a meeting agenda for a SkillsUSA-VICA monthly meeting.
- Attend a professional organization meeting.
- Participate in the American Spirit Award competition with SkillsUSA-VICA.

INTEGRATION LINKAGES

SkillsUSA-VICA, *Professional Development Program,* SkillsUSA-VICA, Communications and Writing Skills, Teambuilding Skills, Research, Language Arts, Sociology, Psychology, Math, Math for Technology, Applied Communications, Social Studies, Problem Solving, Interpersonal Skills, Employability Skills, Critical-Thinking Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Chamber of Commerce, Colleges, Universities, Technology Centers, and Employment Agencies

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 2.0

Students will apply mathematics and science concepts to collision repair technology.

LEARNING EXPECTATIONS

The student will:
2.1 Relate mathematics to collision repair and refinish technology
2.2 Relate scientific concepts to collision repair and refinish technology.
2.3 Examine the materials and construction of vehicles.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
2.1.A Estimates the results of basic arithmetic operations, and can accurately round up or down depending on the appropriate rule for the situation.
2.1.B Visually formulates an angle, (e.g. suspension system or drive belt) and verifies its conformance to the manufacturer's specified angle.
2.1.C Determines if the lines of an automobile are vertical or horizontal as specified in the original design specifications.
2.1.D Interprets symbols to determine compliance with the manufacturer's specifications.
2.1.E Solves equations using graphical, numerical, and algebraic methods.
2.1.F Distinguishes between Fahrenheit and centigrade temperature measurement devices and determines which to use for a specific situation.
2.2.A Correlates the following concepts with their role in automotive collision repair technology:
- heat transfer
- conduction
- radiation
- convection
- expansion
- contraction
- force (in relation to realignment)
- Newton's laws of motion
- energy conversion
- heat energy
- the three states of matter

2.2.B Analyzes the characteristics and implements safety requirements of solvents used in an collision repair and refinish facility.
2.2.C Examines the following automotive applications of acoustics:
- how sound generated in one place in the body and engine can be carried to other parts of the engine through metal and other materials.
- how the frequency of the sound relates to a normal or abnormally operating system.
- why a specific noise sounds different depending on the acoustics of the vehicle.
- what happens when an object resonates.

2.2.D Uses a scale to measure component weight in order to balance rotating systems.
2.2.E Illustrates how an applied force at one location can be transmitted via fluid pressure to provide a force at a remote location on the vehicle.
2.2.F Analyzes how heat affects the different strengths of metal.
2.3.A Compares the different types of construction for unibody and body-over-frame vehicles.
2.3.B Illustrates how vehicles are assembled and how net unit build and coining are used to fit body panels.
2.3.C Distinguishes the different types of materials used for vehicle construction.
2.3.D Assesses the importance of restoring vehicle dimensions.

2.3.E Examines how cams, pulleys, and levers are used to multiply force or transfer directions of force in a mechanical system.
2.3.F Characterizes new materials and the uses and characteristics of known materials.

SAMPLE PERFORMANCE TASKS

- Demonstrate safety procedure for handling solvents.
- Diagram the construction of a body-over-frame vehicle.
- Explain how a piece of equipment used in body repair employs physics concepts in its operation.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 3.0

Students will demonstrate proper procedures for preparing vehicles for repair.

LEARNING EXPECTATIONS

The student will:
3.1 Develop a repair strategy.
3.2 Prepare the vehicle for repair.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
3.1.A Reviews the damage report. N-BII-A-1
3.1.B Analyzes damage to determine appropriate methods for overall repair. N-BII-A-1
3.1.C Develops a repair plan. N-BII-A-1
3.2.A Inspects, removes, stores, and replaces the following:
- exterior trim and moldings N-BII-A-2
- interior trim and components N-BII-A-3
- non-structural body panels and components that may interfere with or be damaged during repair N-BII-A-4
- all vehicle mechanical and electrical components that may interfere with or be damaged during repair N-BII-A-5
- repairable plastics and other components that are recommended for off-vehicle repair N-BII-A-9

3.2.B Protects panels, glass, and parts adjacent to repair area. N-BII-A-6
3.2.C Soap and water washes entire vehicle; uses appropriate cleaner to remove contaminants from those areas to be repaired. N-BII-A-7
3.2.D Removes corrosion protection, undercoatings, sealers, and other protective coatings necessary to perform repairs. N-BII-A-8
3.2.E Applies safety procedures associated with all of the following:
- vehicle components and systems such as ABS, air bags, refrigerants, batteries, tires, oil, anti-freeze, engine coolants, etc. N-BII-A-10
- environmental practices associated with vehicle components and systems such as substrates, fluids, refrigerants, batteries, etc. N-BII-A-11

SAMPLE PERFORMANCE TASKS

- Develop a repair plan for a damaged vehicle.
- Remove any components that might be damaged during repair.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 4.0

Students will demonstrate proper procedures for making outer body panel repairs, replacements, and adjustments.

LEARNING EXPECTATIONS

The student will:
4.1 Analyze damage and develop a repair plan for outer body damage.
4.2 Perform outer body panel replacements, alignments, adjustments, and repairs.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
4.1.A Determines the extent of direct and indirect damage and direction of impact; develops repair plan. N-BII-B-1
4.1.B Determines the extent of damage to aluminum body panels. N-BII-B-3
4.2.A Performs the following inspections, replacements, and alignments:
- Inspects, removes and replaces bolted, bonded, and welded steel panel or panel assemblies. N-BII-B-2
- Inspects, removes, replaces, and aligns hood, hood hinges, and hood latch. N-BII-B-4
- Inspects, removes, replaces, and aligns deck lid, lid hinges, and lid latch. N-BII-B-5
- Inspects, removes, replaces, and aligns doors, tailgates, hatches, lift gates, latches, hinges, and related hardware. N-BII-B-6
- Inspects, removes, replaces, and aligns bumper bars, covers, reinforcement guards, isolators, and mounting hardware. N-BII-B-7
- Inspects, removes, replaces and aligns front fenders, headers, and other panels. N-BII-B-8

4.2.B Performs the following repairs to panels:
- Straightens and roughs-out contours of damaged panel to a surface condition for body filling or metal finishing using power tools, hand tools, and weld-on pull attachments. N-BII-B-9
- Welds cracked or torn steel body panels; repairs broken welds. N-BII-B-10
- Cuts out damaged sections of sheet steel body panels and welds in replacements according to manufacturer/industry specifications. N-BII-B-12
- Repairs, welds or replaces aluminum body panels in accordance with manufacturer's specifications. N-BII-B-3
- Replaces or repairs rigid, semi-rigid, and flexible plastic panels according to manufacturer's/industry specifications. N-BII-B-14
- Performs panel bonding. N-BII-B-16

4.2.C Restores corrosion protection. N-BII-B-11
4.2.D Replaces door skins according to manufacturer's procedures. N-BII-B-13
4.2.E Restores sealers, sound deadeners, and foam fillers. N-BII-B-15
4.2.F Diagnoses and repairs water leaks, dust leaks, and wind noise. N-BII-B-17

SAMPLE PERFORMANCE TASKS

- Examine a vehicle involved in a collision. Determine the extent of all outer body damage. Develop a strategy for repairing damage.
- Repair damaged steel body panel.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 5.0

Students will demonstrate proper procedures for metal finishing, body filling, and moveable glass and hardware repair or replacement.

LEARNING EXPECTATIONS

The student will:
5.1 Perform metal finishing and body filling.
5.2 Repair, adjust, or replace removable glass and hardware.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
5.1.A Removes paint from the damaged area of a body panel. N-BII-C-1
5.1.B Locates and reduces surface irregularities on a damaged body panel. N-BII-C-2
5.1.C Demonstrates hammer and dolly techniques. N-BII-C-3
5.1.D Heat shrinks and cold shrinks stretched panel areas to proper contour. N-BII-C-4, N-BII-C-5
5.1.E Mixes and applies body filler; shapes during curing. N-BII-C-7, N-BII-C-6
5.1.F Rough sands cured body filler to contour; finish sands. N-BII-C-8
5.2.A Inspects, adjusts, repairs or replaces window regulators, run channels, glass, power mechanisms, and related controls. N-BII-D-1
5.2.B Diagnoses and repairs water leaks, dust leaks, and wind noises; inspects, repairs, and replaces weather-stripping. N-BII-D-2
5.2.C Inspects, repairs or replaces, and adjusts removable, manually or power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs. N-BII-D-3
5.2.D Inspects, removes, reinstalls, and aligns convertible top and related mechanisms. N-BII-D-4

SAMPLE PERFORMANCE TASKS

- Heat shrink a stretched panel area.
- Determine need for body filler on a damaged vehicle. Apply body filler to damaged area.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 6.0

Students will properly perform welding and cutting techniques for collision repair.

LEARNING EXPECTATIONS

The student will:
6.1 Prepare for welding and cutting operations.
6.2 Perform welding and cutting techniques.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
6.1.A Identifies weldable and non-weldable materials used in collision repair. N-BII-E-1
6.1.B Determines the correct welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation. N-BII-E-3
6.1.C Sets up welding equipment and adjusts the welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the material being welded; determines work clamp (ground) location and attaches. N-BII-E-4, N-BII-E-5, N-BII-E-7.
6.1.D Stores, handles, and installs high-pressure gas cylinders. N-BII-E-6
6.1.E Protects the following:
- Protects adjacent panels, glass, vehicle interior, etc. from welding and cutting operations. N-BII-E-9
- Protects computers and other electronic control modules during welding procedures according to manufacturer's specifications. N-BII-E-10

6.1.F Cleans and prepares the metal to be welded, assures good metal fit-up, applies weld-through primer if necessary, and clamps as required. N-BII-E-11
6.2.A Makes the following determinations:
- Determines the joint type (butt weld with backing, lap, etc.) for weld being made according to manufacturer's/industry specifications. N-BII-E-12
- Determines the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation according to manufacturer's/industry specifications. N-BII-E-13

6.2.A Welds and cuts high-strength steel and other metals using manufacturer's procedures. N-BII-E-2
6.2.B Uses the proper angle of the gun to the joint and the direction of the gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions. N-BII-E-8
6.2.C Performs the following welds:
- continuous, stitch, tack, plug, butt weld with backing, and lap joints N-BII-E-14
- squeeze-type resistance spot welding (according to manufacturer's/industry specifications) N-BII-E-15

6.2.D Performs destructive tests on each weld type. N-BII-E-16
6.2.E Identifies the causes of the following and makes necessary adjustments:
- spits and sputters, burn through, lack of penetration, porosity, incomplete fusion, excessive spatter, distortion, and waviness of bead N-BII-E-17
- contact tip burn-back and failure of wire to feed N-BII-E-18

6.2.F Identifies cutting process for different materials and locations in accordance with manufacturer's procedures; performs cutting operation. N-BII-E-19

SAMPLE PERFORMANCE TASKS

- In a team, determine need for welding operations for a damaged vehicle. Prepare work area for the appropriate welding operation. Correctly demonstrate the weld.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 7.0

Students will demonstrate communication skills required in the collision repair and refinish industry.

LEARNING EXPECTATIONS

The student will:

7.1 Communicate and comprehend oral and written information typically pertaining to non-structural analysis and damage repair.
7.2 Solve non-structural repair problems and make decisions using a logical process.
7.3 Use teamwork skills to accomplish goals, solve problems, and manage conflict within groups.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

7.1.A Interprets and uses written information in common job formats, such as tables, charts, and reference materials and manuals relating to metals, compounds, and plastics relating to non-structural damage repair.
7.1.B Interprets and uses graphical information such as blueprints, electrical schematics, process control schematics, automotive flow diagrams, and other automotive diagrams.
7.1.C Uses electronic resources to obtain information on repaired vehicles.
7.1.D Analyzes information obtained from various sources to determine a diagnostic approach.
7.1.E Communicates clearly and appropriately in oral and written form.
7.2.A Develops a hypothesis regarding the cause of a non-structural repair problem.
7.2.B Tests the hypothesis to determine the solution to the non-structural repair problem.
7.2.C Creates, evaluates, and revises as needed a plan to resolve a problem in the classroom or workplace.
7.3.A Serves in each of the functional roles of a team.
7.3.B Resolves conflicts within a group.
7.3.C Demonstrates appropriate and positive examples of giving and accepting criticism.
7.3.D Modifies behavior or revises work based on appropriate criticism.
7.3.E Solves problems in cooperation with other members of a group.
7.3.F Evaluates the role of the non-structural analysis and repair technician within the organizational system.

SAMPLE PERFORMANCE TASKS

- Use reference materials to determine procedures for non-structural analysis and damage repair.
- Work as a team member to develop an analytical strategy.
- Use blueprints and diagrams to execute a task.

INTEGRATION LINKAGES

Communication Skills, Teamwork Skills, Computer Skills, Reading and Writing Skills, Language Arts, Problem Solving, Interpersonal Skills, Employability Skills, Critical-Thinking Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), National Institute for Automotive Service Excellence, National Automotive Technician Education Foundation, SkillsUSA-VICA, AYES curriculum.

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 8.0

Students will demonstrate interpersonal and employability skills required in the collision repair and refinish industry.

LEARNING EXPECTATIONS

The student will:

8.1 Analyze relationships between work ethics, organizational skills, and personal job success.
8.2 Demonstrate attitudes conducive to working in a team.
8.3 Compare the correlation between a clean orderly work environment and successful and efficient job performance.
8.4 Assess implications of diversity for communities and workplaces.
8.5 Develop individual time management and work sequencing skills.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

8.1.A Illustrates the concept of a "work ethic."
8.1.B Assesses the potential impact of an individual's work ethic on an organizational system.
8.1.C Infers the relationship between work ethics and personal job success.
8.2.A Judges which attitudes are conducive to success.
8.2.B Modifies behavior to reflect attitudes for success.
8.3.A Keeps work area organized and free from clutter and maintains tool and equipment control.
8.3.B Cleans work area according to shop standard and NATEF, and OSHA requirements.
8.3.C Maintains a neat and orderly work area.
8.4.A Points out benefits and problems that may arise from diversity in manufacturers.
8.4.B Devises solutions to problems arising from diversity in individuals, cultures, and manufacturers.
8.4.C Demonstrates proper dress and grooming for work in a collision repair and refinish facility.
8.5.A Assesses the benefits of incorporating time management principles into non-structural analysis and damage repair.
8.5.B Displays time management and work sequencing skills.

SAMPLE PERFORMANCE TASKS

- Maintain an orderly work area.
- Consistently arrive at class on time.
- Serve as an intern with a dealership or fleet shop.
- Resolve an interpersonal conflict in the classroom.

INTEGRATION LINKAGES

Math, Science, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Secretary's Commission on Achieving Necessary Skills, National Institute for Automotive Service Excellence, National Automotive Technician Education Foundation, Occupational Safety and Health Administration, Environmental Protection Agency, SkillsUSA-VICA, AYES curriculum.

COLLISION REPAIR: NON-STRUCTURAL

STANDARD 9.0

Students will demonstrate safety practices pertaining to collision repair technology, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) requirements for a collision repair and refinish facility.

LEARNING EXPECTATIONS

The student will:

9.1 Determine the safe and correct application for chemicals used in a collision repair and refinish facility.
9.2 Use protective clothing and safety equipment.
9.3 Use fire protection equipment.
9.4 Follow OSHA and EPA regulations affecting collision repair and refinish technology.
9.5 Respond to safety communications pertaining to non-structural damage repair.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

9.1.A Conforms to federal, state, and local regulations when handling, storing, and disposing of chemicals.
9.1.B Ensures proper ventilation for chemical and dust.
9.1.C Locates first aid supplies.
9.2.A Demonstrates proper usage of special safety equipment.
9.2.B Selects and uses the appropriate protective clothing for a given task.
9.2.C Demonstrates eye, respiration, and skin protection.
9.3.A Distinguishes the proper fire extinguisher for each class of fire.
9.3.B Demonstrates the proper use of a fire extinguisher.
9.4.A Locates regulatory information.
9.4.B Extracts information from Material Safety Data Sheets pertaining to shop chemicals.
9.4.C Complies with relevant regulations and standards.
9.4.D Passes with 100% accuracy a written examination relating specifically to non-structural analysis and damage repair safety issues.
9.4.E Passes with 100% accuracy a performance examination relating specifically to non-structural analysis and damage repair tools and equipment.
9.4.F Maintains a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor.
9.5.A Interprets safety communications from manufacturers and takes action to insure a safe working environment.
9.5.B Complies with safety signs and symbols.

SAMPLE PERFORMANCE TASKS

- Assess the work area for safety hazards.
- Design a corrections program for identified hazards.
- Model the appropriate protective equipment for an assigned task.

INTEGRATION LINKAGES

Math, Science, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Secretary's Commission on Achieving Necessary Skills, National Institute for Automotive Service Excellence, National Automotive Technician Education Foundation, Occupational Safety and Health Administration, Environmental Protection Agency, SkillsUSA-VICA, AYES curriculum.

COLLISION REPAIR: NON-STRUCTURAL

SAMPLING OF AVAILABLE RESOURCES

Enhanced Delivery I-Car Curriculum, I-CAR

Auto Collision Curriculum Guide, Instructional Materials Laboratory (IML), University of Missouri

Professional Automotive Collision Repair, 2nd Ed, Duffy, Delmar Publishing

Auto Body Repairing and Refinishing, Goodheart-Willcox, 2000.

Teacher Web resources:

Math/Science Web Site http://enc.org

National Science Teachers Association http://www.nsta.org/store

Center for Occupational Research and Development (CORD) http://www.cord.org/

Delmar International Thomson Learning http://www.delmar.com/

University of Missouri Instructional Materials Lab (IML)
http://www.iml.coe.missouri.edu/

Oklahoma Curriculum Instructional Materials Center (CIMC)
http://www.okvotech.org/cimc/home.htm